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New Erigonine Spiders Found in Hokkaido, Japan

By

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(Communicated by Yoshihiko KUROSAWA)

Abstract Eight new erigonine spiders are described from Hokkaido, Japan, and a new genus is erected for one of them. They are *Walckenaeria mayumiae* sp. nov., *W. nishikawai* sp. nov., *W. soukoyoensis* sp. nov., *Dicymbium salaputium* sp. nov., *Paratapinocyba kumadai* gen. et sp. nov., *Diplocephalus yasudai* sp. nov., *Milleriana ezoensis* sp. nov. and *Hilaira monedula* sp. nov. Of these new species, those belonging to the genera *Dicymbium* and *Hilaira* are recorded for the first time from Japan.

According to YAGINUMA (1957), the first record of spiders in Hokkaido was found in MATSUMURA's "Atsuta Saishû Kikô" (Field Collecting Notes at Atsuta) (1894). Since then, several reports have been made on the spider fauna of Hokkaido, by S. SAITO (1933, 1934), YAGINUMA (1957), AKIYAMA (1960, 1961 a, b, 1962), SHINKAI & TAKENO (1966), and others. However, only a few studies have been made on the taxonomy of linyphiid spiders. *Prolinyphia emphana* (*Linyphia emphana*) was first recorded by S. SAITO (1933) in the "Spiders from the Islands of Rishiri and Rebun." He further recorded seven linyphiids in the "Spiders from Hokkaido", and described one of them (erigonine species) as a new species, *Oedothorax trilineatus*. UYEMURA (1937) reported a linyphiid in the "Spiders from Otaru and Atsuta." Later, the spider fauna of Hokkaido and its accessory islands was studied by YAGINUMA in the "Spiders from Hokkaido and Rishiri Island" (1957) and in his later report (1966), by YAGINUMA & OHNO (1967), and by AKIYAMA (1961 a). AKIYAMA (1961 b, 1962) recorded four species of linyphiid spiders from Yukomanbetsu and Asahikawa, while SHINKAI & TAKENO (1966) reported six species from Jôzankei and Onneyu. In the meantime, OI (1960) made a detailed taxonomic study of the Japanese species of this group of spiders. However, many of the reports on the linyphiid spiders from Hokkaido made before 1970 dealt only with relatively large species, and only a few of them contained records of erigonine species.

In recent years, many noticeable findings in this group of spiders from Hokkaido were made in the "Spiders of Mt. Daisetsu, Hokkaido" by YAGINUMA & NISHIKAWA (1971) based on the JIBP-CT, and in YAGINUMA's "Spiders of the Hidaka Mountain Range, Hokkaido, Japan" (1972). On the other hand, based on a survey of the spider fauna of Mt. Daisetsu, the Ishikari River Basin, and the northern part of Hokkaido, reports have been made by YASUDA (1979, 1980, 1981) and KUMADA (1979 a, b) especially on the soil-dwelling linyphiids, and the spiders of this group become

gradually identified.

Fortunately, I had the opportunity of examining many Hokkaido specimens of this group of spiders through the kindness of the arachnologists mentioned below, and found many interesting species including new ones among the specimens mainly collected on the Daisetsu Mts. I have already examined more than 400 specimens of this group, and recorded 75 species belonging to 38 genera in my previous papers (H. SAITO, 1982, 1983). In the present paper, seven new species already suggested in the earlier papers and an additional new species are described. All the type materials are preserved in the National Science Museum (Nat. Hist.), Tokyo. Specimens other than the type material are deposited in the collection of the Sounkyo Museum of Natural History and in my private collection separately.

Before going further, I wish to express my cordial thanks to Dr. Shun-Ichi UÉNO and Mr. Hirotugu ONO, National Science Museum, Tokyo, for their kindness in reading through the manuscript and making comment on it. I am also indebted to Dr. Ryoji OI, ex-professor of Baika Women's College, Dr. Takeo YAGINUMA, Ohtemon-Gakuin University, and Dr. A. F. MILLIDGE, British Arachnological Society, who gave me valuable taxonomic suggestion about the linyphiid spiders from Hokkaido, and to Mr. Nobuki YASUDA, Sounkyo Museum of Natural History, for offering most of the specimens upon which the present paper is based. My thanks are due to the following arachnologists for their kindness in offering material: Drs. Takeo YAGINUMA, Nobuo TSURUSAKI, Masayoshi SUWA, Messrs. Yoshiaki NISHIKAWA, Nobuki YASUDA, Hiroshi TOKUMOTO, Yoneji AKITA, Katsuhisa FURUNO, Kenichi KUMADA and Miss Mayumi MATSUDA.

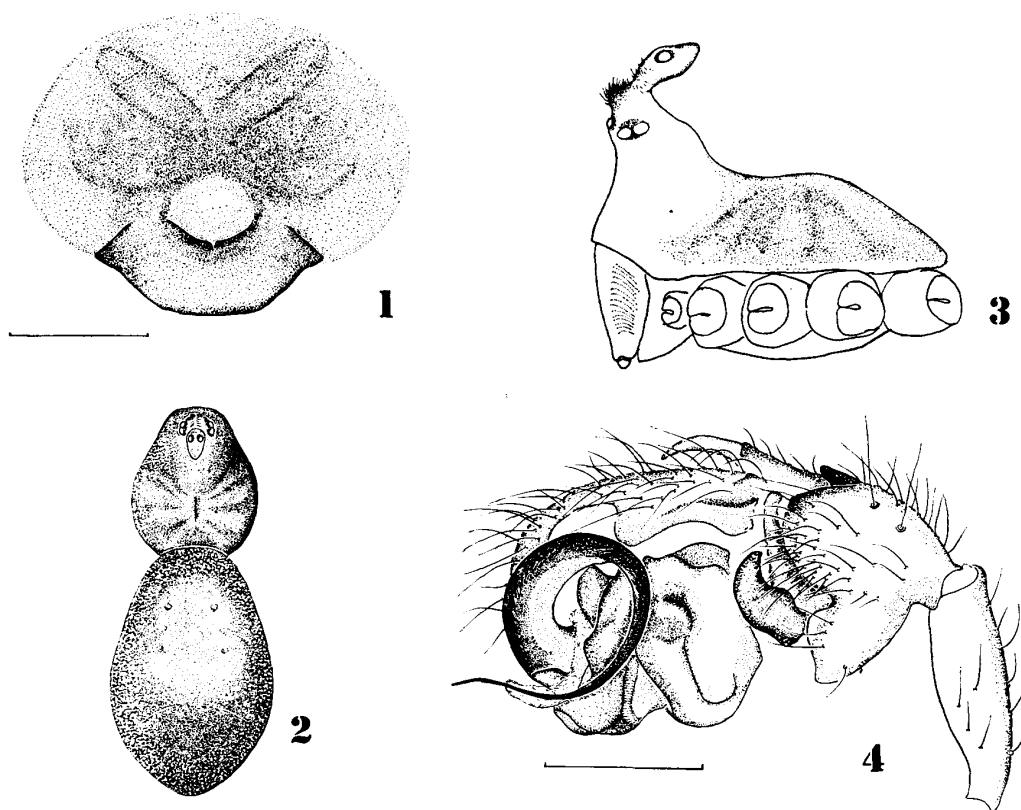
Walckenaeria mayumiae sp. nov.

[Japanese name: Matsuda-eboshi-nukagumo]

(Figs. 1–4)

Male. Body length 2.3 mm; cephalothorax 1.05 mm long, 0.75 mm wide.

Carapace brown to dark brown, with darker radial striae. Head strongly elevated, with a small peculiar lobe carrying posterior median eyes; viewed from above the lobe egg-shaped and slightly pointed posteriorly. Posterior median eyes nearly on top of cephalic lobe and separated from each other by a distance more than the diameter. Anterior eye-row nearly straight; median eyes separated from each other by a distance a little less than the diameter and from lateral ones by the diameter. Clypeus perpendicular, strongly concave below eyes and then slanting forward. Chelicerae yellowish brown with three promarginal teeth and also with distinct stridulating organ laterally. Sternum dusky yellowish brown, slightly darker at the margin and longer than wide. Posterior coxae separated approximately by the long axis. Legs light brown. Tibiae I–II each with two dorsal spines and tibiae III–IV each with one dorsal spine. All metatarsi with a trichobothrium, Tm I *ca.* 0.52. Abdomen dark grey to black, with two pairs of impressions on dorsum.



Figs. 1–4. *Walckenaeria mayumiae* sp. nov. — 1. Epigynum. 2. Male cephalothorax and abdomen, dorsal view. 3. Male cephalothorax, lateral view. 4. Male palp, ectal view. (Scale lines: Fig. 1, 0.1 mm; Fig. 4, 0.2 mm.)

Palp. The structure as shown in Fig. 4. Ratio of the length of femur to that of patella 9:13. Tibia a little longer than patella, dorsally produced into two apophyses; mesal one very small, triangular and strongly chitinized; lateral one longer, scythe-like, strongly curved outwards.

Female. Body length 2.3 mm; cephalothorax 1.18 mm long, 0.80 mm wide.

Similar to the male except for the following respects: cephalothorax and abdomen generally larger than those of male; head slightly elevated at the back of eyes, without peculiar lobe; posterior eye-row nearly straight, median eyes separated from each other by the radius and from lateral ones by a distance a little less than that; sternum posteriorly produced between hind coxae which are separated by a space a little less than the long axis. Epigynum as shown in Fig. 1.

Holotype: ♂, Kamishihoro-machi, Katou-gun, Hokkaido, 31-X-1983, M. MATSUDA leg. (NSMT-Ar 1063). **Paratypes:** 1 ♀, same data as holotype (NSMT-Ar 1064); 1 ♀ 1 ♂ 1 ♀ y, Nakayama-tôge, Sapporo-shi, Hokkaido, 5-VIII-1983, N. TSURUSAKI leg. (NSMT-Ar 1065).

Remarks. This new species is distinctly different from any of the other known species from Europe and America in the form of male chephalic lobe and palpal tibia. It is named after Miss Mayumi MATSUDA living in Hokkaido, who offered many

specimens for my study.

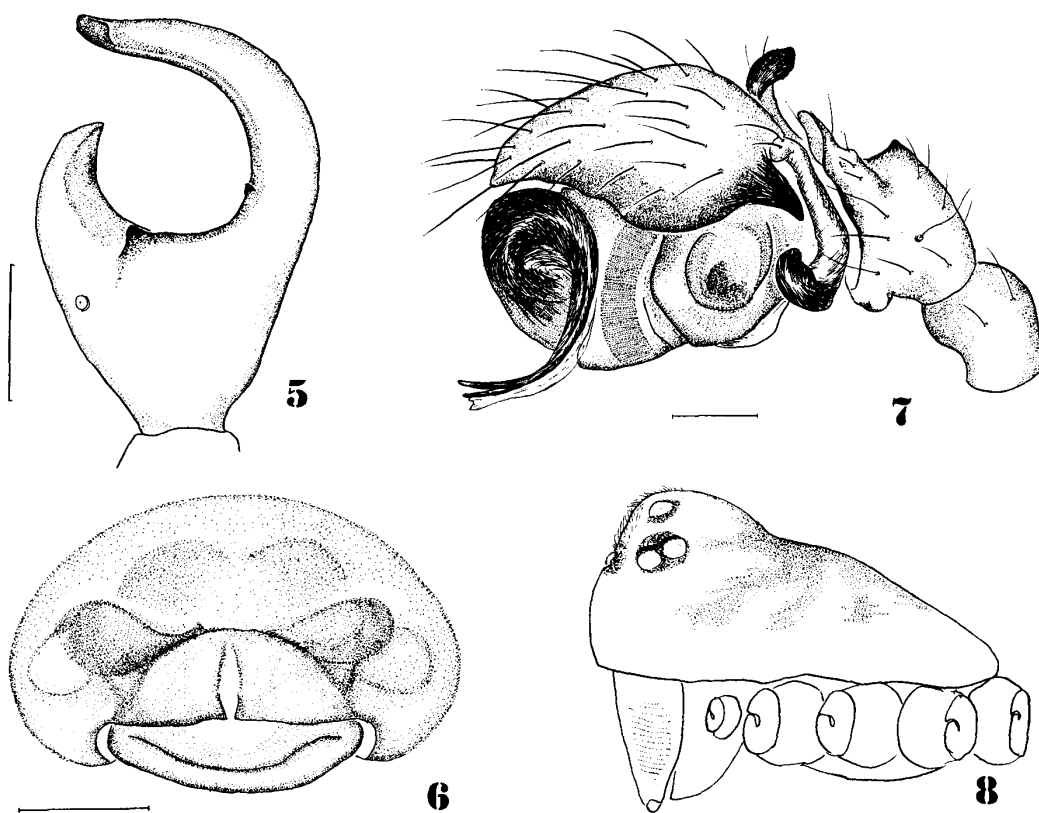
Walckenaeria nishikawai sp. nov.

[Japanese name: Nishikawa-kobunukagumo]

(Figs. 5–8)

Male. Body length 1.5–1.7 mm; cephalothorax 0.75–0.80 mm long, 0.63–0.68 mm wide.

Carapace yellowish brown with distinct black radiating lines. Head rounded and much raised, carrying posterior median eyes near the top. Clypeus convex, slightly longer than the length of median ocular area. Eyes with black ring. Anterior eye-row straight; median eyes separated from each other by the radius, and from lateral ones by about twice the diameter of lateral eye. Posterior eye-row slightly procurved; median eyes separated from each other by about 1.5 times the diameter. Clypeus wide, strongly convex. Chelicerae with 4 promarginal and 4 retromarginal teeth. Sternum pale yellowish brown suffused with dusky grey, convex, darker at the margin, heart-shaped. Hind coxae separated by a space a little less than the long axis. Legs



Figs. 5–8. *Walckenaeria nishikawai* sp. nov. — 5. Male left palpal tibia, dorsal view. 6. Epigynum. 7. Male palp, ectal view. 8. Male cephalothorax, lateral view. (Scale lines: Figs. 5–7, 0.1 mm.)

pale yellowish brown. Tibiae I–II each with two spines, tibiae III–IV each with one spine. Metatarsi each with a trichobothrium, Tm I *ca.* 0.75. Abdomen grey to black, with two pairs of impressions on dorsum.

Palp. Ratio of the length of femur to that of patella 3:1. Tibia short but dorsally prolonged into two long, curved apophyses as shown in Fig. 5; inner one longer, with a minute spinous process at the base.

Female. Similar to male in general form and appearance, but the head is less elevated. Anterior eye-row straight; median eyes separated from each other by a distance a little shorter than twice the diameter. Posterior eye-row nearly straight; eyes subequal in size, separated by nearly equal intervals a little longer than the diameter of median eye. Epigynum as shown in Fig. 6. Palpal tibia with one trichobothrium on dorsum. Tm I *ca.* 0.80.

Holotype: ♂, Yukomanbetsu, Hokkaido, 11–VII–1970, Y. NISHIKAWA leg. (NSMT-Ar 1066). **Paratypes:** 2 ♂♂, 9 ♀♀, same data as holotype (NSMT-Ar 1067).

Other specimens examined: 2 ♀, Mt. Kurodake, 8–VII–1970, 1 ♀, Yukomanbetsu, 10–VII–1970, 1 ♀, Mt. Daisetsu, 14–VII–1970, Y. NISHIKAWA leg.; 1 ♂, Jôzankei, 22–VI–1983, Y. AKITA leg.

Remarks. This new species can be distinguished at a glance from any other species of the genus by having peculiar palpal tibia in male. It is named after Mr. Yoshiaki NISHIKAWA, Professor of Biology at Ohtemon-Gakuin University, who first collected the species in Hokkaido.

***Walckenaeria sounkyoensis* sp. nov.**

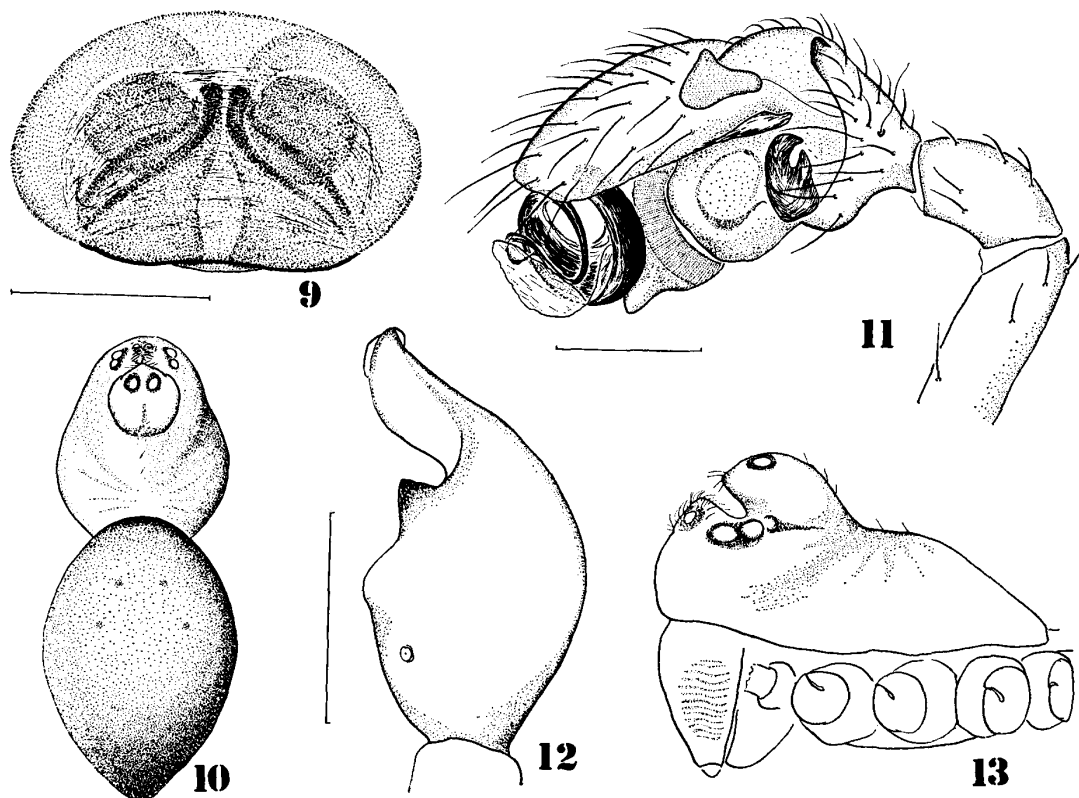
[Japanese name: Marukobu-nukagumo]

(Figs. 9–13)

Male. Body length 1.5 mm; cephalothorax 0.63 mm long, 0.53 mm wide.

Colour of cephalothorax and appendages yellowish brown; sternum strongly suffused with black. Carapace with a high cephalic lobe carrying posterior median eyes near the top; the lobe nearly circular in dorsal view, slightly pointed anteriorly, and with postocular sulci at the base. Anterior eye-row nearly straight; median eyes separated from each other by a distance little less than the diameter and from lateral ones by about the diameter. Anterior lateral eyes larger than the remainder, adjacent to the posterior lateral eyes. Posterior median eyes separated from each other nearly by the diameter. Clypeus gently convex. Sternum roundly heart-shaped and slightly convex. Hind coxae separated by a length 1.5 times the long axis. Chelicerae armed with 5 promarginal teeth. Tibiae each with one spine. Metatarsus IV with a trichobothrium, Tm I *ca.* 0.61. Abdomen pale grey to dark grey, with two pairs of indistinct impressions on dorsum.

Palp. Ratio of the length of femur to that of patella 9:4. Tibia longer than patella, dorsally produced into two apophyses; mesal one longer, finger-like, gently curved outwards; lateral one shorter, strongly chitinized, like a saw-tooth in shape.



Figs. 9–13. *Walckenaeria sounkyoensis* sp. nov. — 9. Epigynum. 10. Male cephalothorax and abdomen, dorsal view. 11. Male palp, ectal view. 12. Male left palpal tibia, dorsal view. 13. Male cephalothorax, lateral view. (Scale lines: Figs. 9, 11–12, 0.1 mm.)

Paracymbium stout and strongly curved; distal arm like a tin-opener in shape as shown in Fig. 11. Embolus broad at base, turning round twice in front of tegulum and remarkably slender at the distal part.

Female. Body length 1.6 mm; cephalothorax 0.68 mm long, 0.48 mm wide.

Colour and general appearance almost the same as in male. Anterior eye-row nearly straight; median eyes separated from each other by a distance a little shorter than the diameter. Posterior eye-row straight; median eyes separated from each other by a distance less than the diameter and from lateral ones nearly by the radius. Chelicerae with 4 promarginal and 3 retromarginal teeth. Tm I *ca.* 0.67. Epigynum consists of a round convex plate which shows a pair of receptacula through the integument; the opening not visible from the ventral surface.

Holotype: ♂, Sounkyo, Hokkaido, 7–VI–1979, N. YASUDA leg. (NSMT-Ar 1068). Paratypes: 1 ♀, same data as holotype (NSMT-Ar 1069); 5 ♀♀, Nisseicharomappu, Hokkaido, 22–VI–1984, N. YASUDA leg. (NSMT-Ar 1070).

Remarks. This new species is somewhat similar to *W. mitrata* (MENGE, 1866), *W. capito* (WESTRING, 1861) and *W. nodosa* (O. P.-CAMBRIDGE, 1873) from Europe, particularly in male, but is easily separated from the former two by having a pair of

postocular sulcus in male, and from the last by having different forms of male cephalic lobe and female epigynum.

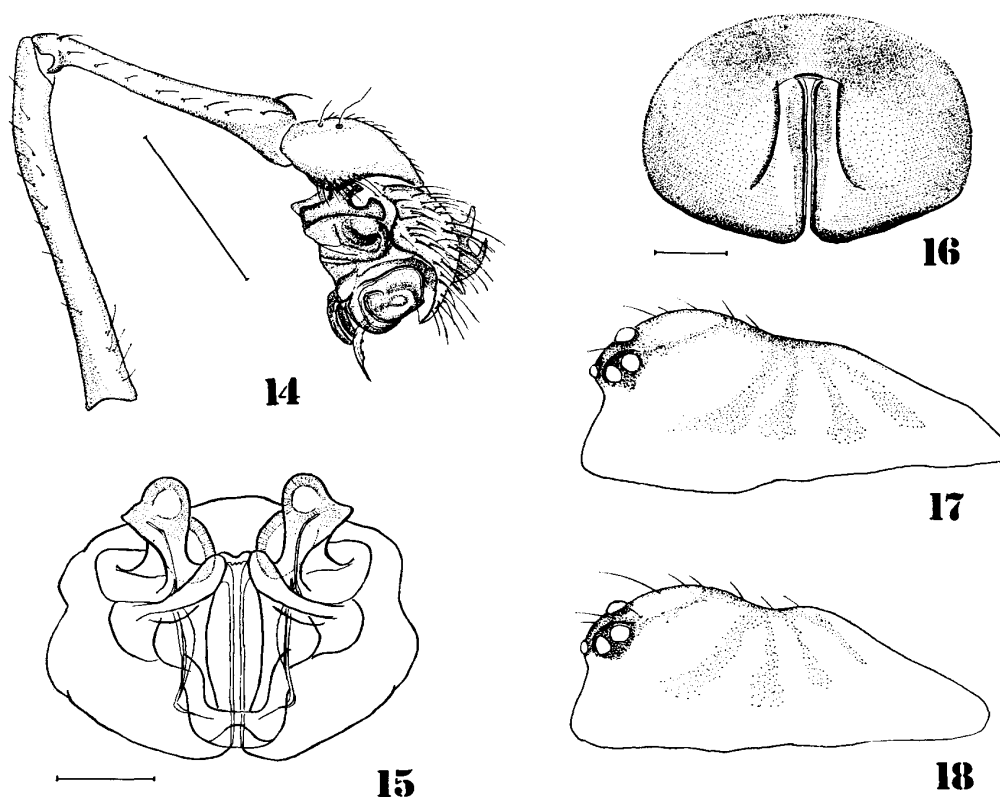
Dicymbium salaputium sp. nov.

[Japanese name: Shuju-kosaragumo]

(Figs. 14–18)

Female. Body length 2.8–3.2 mm; cephalothorax 1.05–1.20 mm long, 0.93–0.98 mm wide.

Colour of cephalothorax yellowish brown with darker radiating lines; head lighter at the top. Head slightly raised back of eyes. Anterior eye-row nearly straight; median eyes smaller than the remainder, separated from each other by a distance a little less than the diameter. Posterior eye-row procurved; eyes separated by nearly equal intervals a little shorter than the radius of median eye, subequal in size. Clypeus slightly longer than length of ocular area, slightly concave below eyes and somewhat slanting forwards. Chelicerae yellowish brown, lighter at tips, and with 4 larger promarginal and 5 retromarginal teeth. Sternum dusky brown, narrowly margined with black, rather broad, slightly convex, produced posteriorly into a truncate point



Figs. 14–18. *Dicymbium salaputium* sp. nov. — 14. Male palp, ectal view. 15. Female genitalia. 16. Epigynum. 17. Male cephalothorax, lateral view. 18. Female cephalothorax, lateral view. (Scale lines: Fig. 14, 0.5 mm; Figs. 15–16, 0.1 mm.)

between hind coxae which are separated by the long axis. Legs light brown. Tibiae I–II each with two spines, tibiae III–IV with one spine. Metatarsi I–III each with a trichobothrium; Tm I *ca.* 0.42, Tm II *ca.* 0.42, Tm III *ca.* 0.36. Epigynum of a round plate with a vertical fissure at the centre; the internal structure as in Fig. 15. Abdomen dark grey to black, with two pairs of impressions on dorsum.

Male. Body length 2.7–2.8 mm; cephalothorax 1.13–1.15 mm long, 0.75–0.95 mm wide.

Similar to female except for the following points: body length smaller; thorax wider; head more elevated; anterior median eyes separated from each other by the radius and posterior median eyes separated from each other nearly by the radius.

Palp. Ratio of the length of femur to that of patella 17:12. Tibia shorter than patella, widely covering the cymbium, and with two trichobothria on dorsum.

Holotype: ♀, Mt. Kurodake, Hokkaido, 27–V–1981, N. YASUDA leg. (NSMT-Ar 1071). *Paratypes:* 5 ♀♀, 27–VII–1981, same data as holotype (NSMT-Ar 1072); 3 ♂♂, Mt. Akadake, 16–VIII–1984, same collector as holotype (NSMT-Ar 1073).

Other specimens examined: 2 ♀♀, 21–VIII–1981, 1 ♂, 17–IX–1981, 1 ♀, 23–VII–1982, 1 ♀, 28–VII–1982, same collector and locality as holotype; 1 ♀, same locality as holotype, 8–VII–1970, Y. NISHIKAWA leg.

Remarks. This species is very similar to *D. facetum* (L. KOCH, 1879) described from Siberia on the basis of a single female, but may be distinguished from the latter by the structural details of female genitalia.

Paratapinocyba gen. nov.

[Japanese name: Yamatokonagumo-zoku]

Type species: *Paratapinocyba kumadai* sp. nov.

This genus is apparently allied to *Tapinocyba* in general features but differs from the latter in the structural details of male palp and female epigynum. The most conspicuous characteristics of this new genus are a greatly developed suprategular apophysis and a long lamellate embolus in the male palp and the absence of a wide keyhole-like opening in the female epigynum.

Although the true taxonomic position is not certain at the present time, this genus seems to belong to the *Tapinocyba* group (in the sense of MILLIDGE, 1977) as suggested by the following characters: Male head with postocular sulcus; tibiae each with one spine, the position of spines on I–III *ca.* 0.1; metatarsus IV without trichobothrium, Tm I *ca.* 0.4; the duct within tegulum sinuous with an abrupt constriction in diameter at the end of the sinuous part.

In addition to the species here described, *Tapinocyba oiwa* H. SAITO, 1980, described from Honshu appears also to belong to this new genus.

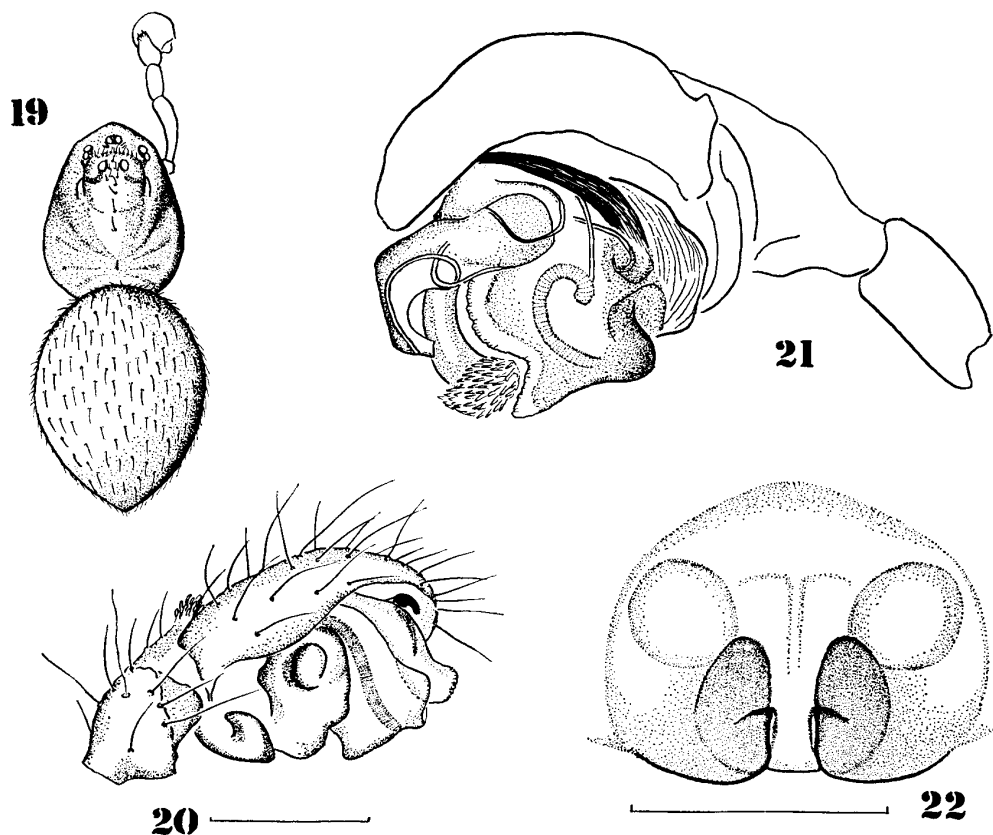
Paratapinocyba kumadai sp. nov.

[Japanese name: Kumada-yamatokonagumo]

(Figs. 19–22)

Male. Body length 1.3–1.5 mm; cephalothorax 0.68–0.75 mm long, 0.50–0.55 mm wide.

Carapace yellowish brown to reddish brown with slightly darker radiating lines. Head rather high, with long straight sulci which run backwards from just behind posterior lateral eyes. Anterior eye-row nearly straight; median eyes about a half of lateral eyes in size, close to each other, and separated from lateral ones by about twice the diameter. Posterior eye-row slightly procurved; eyes subequal in size, median eyes separated by about twice the diameter. Clypeus slightly shorter than the length of ocular area and strongly protruding forwards. Chelicerae light brown to reddish brown with 5 or 6 large promarginal and 5 small retromarginal teeth. Sternum suffused with dusky grey, darker at the margin, convex, roundly heart-shaped; posterior tip produced between hind coxae which are separated by the length. Legs pale yellow to yellowish brown. Tibiae each with one dorsal spine; length of spines on I–III



Figs. 19–22. *Paratapinocyba kumadai* sp. nov. — 19. Male cephalothorax and abdomen, dorsal view. 20. Male palp, ectal view. 21. Male palp, mesal view. 22. Epigynum. (Scale lines: Figs. 20, 22, 0.1 mm.)

about the diameter of tibia and spine on IV about twice the diameter of tibia. Metatarsi I–III each with a trichobothrium, Tm I *ca.* 0.4. Tarsal claws on I–II with 3–4 developed teeth.

Palp. Ratio of the length of femur to that of patella 2: 1. Tibia with a short and broad apophysis tufted at the distal part. Suprategular apophysis projecting towards the end of embolus, tufty distally as in tibial apophysis. Tegulum well developed and protuberant ventrally. The duct within tegulum with an abrupt constriction in diameter at the end of the sinuous part. Abdomen pale yellow to dark grey without markings.

Female. Body length 1.4–1.6 mm; cephalothorax 0.63–0.70 mm long, 0.45–0.48 mm wide.

Similar to male in form and colour, but the head is not elevated and devoid of sulci. Epigynum is represented in Fig. 22.

Holotype: ♂, Yoshioka, Oshima Peninsula, Hokkaido, 23–V–1980, K. KUMADA leg. (NSMT-Ar 1074). **Paratypes:** 3 ♂♂ 7 ♀♀, same data as holotype (NSMT-Ar 1075).

Other specimens examined: 2 ♂♂, 4–VI–1978, 2 ♂♂, 13–VI–1978, 1 ♂ 3 ♀♀, 23–X–1978, 1 ♂ 1 ♀, 13–XII–1978, Maruyama, Sapporo, Hokkaido, K. FURUNO leg.; 1 ♂, 14–V–1978, Mt. Daisetsu, Hokkaido, N. NISHIKAWA leg.

Remarks. This species is externally similar to *P. oiwa* (H. SAITO, 1980), **comb. nov.**, which is transferred from *Tapinocyba* to *Paratapinocyba* on the basis of male palpal conformation, but bears distinct differences in epigynum, tibial apophysis of male palp, and especially in the structural details of male palp. This species is named after Mr. Kenichi KUMADA, Tokyo Spider Study Group, who offered many interesting specimens for my study.

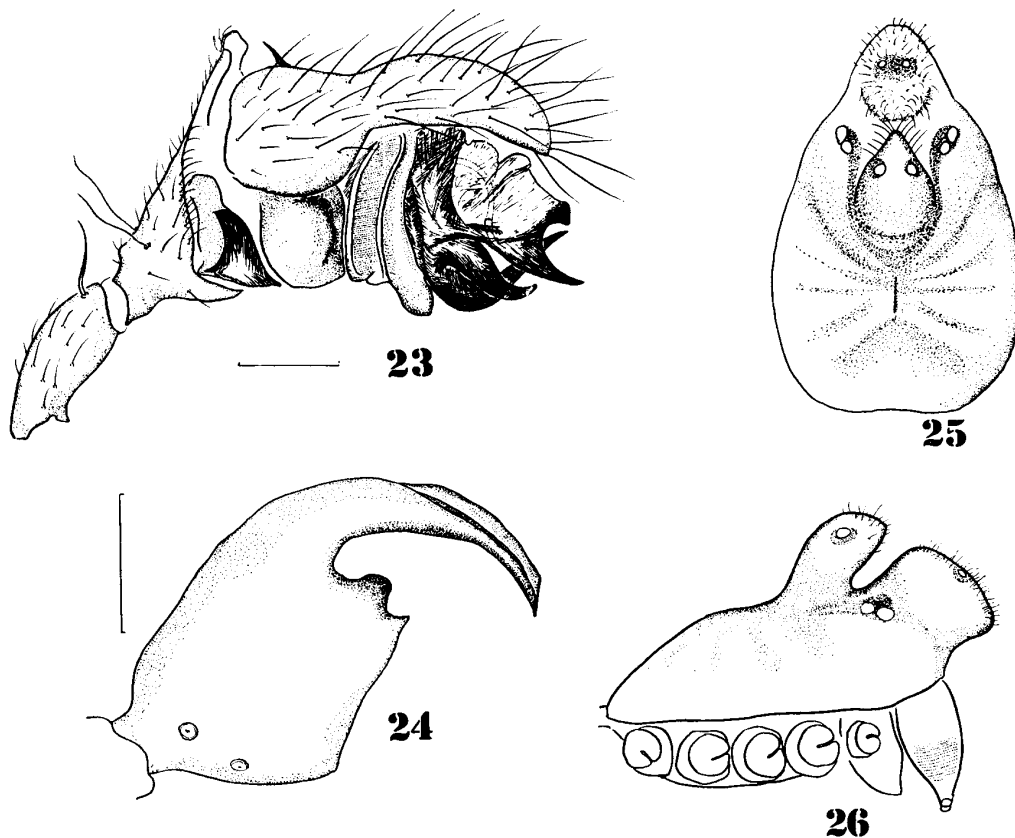
***Diplocephalus yasudai* sp. nov.**

[Japanese name: Yasuda-kobugashira-nukagumo]

(Figs. 23–26)

Male. Body length 2.1–2.4 mm; cephalothorax 1.08–1.13 mm long, 0.70–0.75 mm wide.

Carapace dark brown with darker radial striae and median furrow; viewed from above evenly rounded at the sides onto the lateral sides of anterior lateral eyes where there is a slight constriction, from there the sides are gently curved but strongly convergent towards the front, which is narrow, bluntly pointed. Cephalic part extended forwards and upwards, with a peculiar lobe posteriorly; viewed from above the lobe sharply pointed in front, widely rounded behind, and carrying posterior median eyes near the top. Posterior median eyes on the cephalic lobe separated from each other by a distance more than twice the diameter. Anterior median eyes separated from each other nearly by twice the diameter. Clypeus protruding forwards, densely clothed with short hairs directed upwards, strongly retreating near the middle.



Figs. 23–26. *Diplocephalus yasudai* sp. nov. — 23. Male palp, ectal view. 24. Male right palpal tibia, dorsal view. 25. Male cephalothorax, dorsal view. 26. Male cephalothorax, lateral view. (Scale lines: Figs. 23–24, 0.1 mm.)

Chelicerae reddish brown with 5 promarginal and retromarginal teeth. Sternum brown, suffused with black. Hind coxae separated by a space slightly longer than the long axis. Legs light brown, order of length 4, 1, 2, 3. Tibiae I–II each with two dorsal spines, tibiae III–IV each with one spine. Metatarsi I–III each with a trichobothrium, Tm I *ca.* 0.35. Abdomen dark grey to black, without any markings.

Palp. The structure as shown in Fig. 23. Ratio of the length of femur to that of patella 11:6. Tibia longer than patella, armed on the dorsolateral margin with a long apophysis strongly incurved and pointed distally. Paracymbium strongly curved and flattened distally.

Female. Unknown.

Holotype: ♂, Mt. Kurodake, Hokkaido, 27–VII–1981, N. YASUDA leg. (NSMT-Ar 1076). **Paratypes:** 3 ♂♂, same data as holotype (NSMT-Ar 1077); 1 ♂, 13–IX–1977, do. (NSMT-Ar 1078).

Remarks. This species is very readily separated from any other species of the genus by the shape of cephalic lobe and palpal tibia, and by the difference in the details of palpal conformation. It is named after Mr. Nobuki YASUDA, who collected many of the specimens used in this paper.

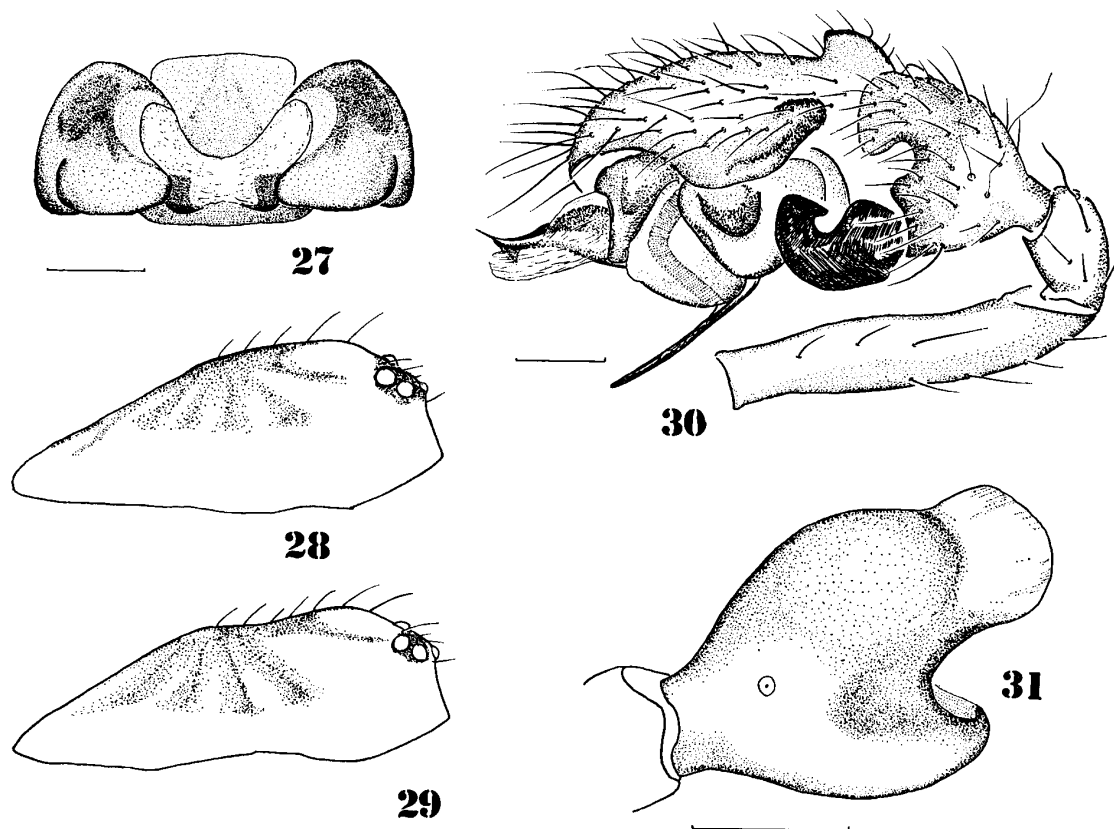
Milleriana ezoensis sp. nov.

[Japanese name: Ezo-yamakosaragumo]

(Figs. 27–31)

Male. Body length 2.5–2.8 mm; cephalothorax 1.05–1.15 mm long, 0.80–0.85 mm wide.

Carapace chestnut brown with darker radial striae, median furrow and cervical grooves, and also with a distinct blackish pentagonal markings and some bristles arranged in a row in front of the median furrow; side margins narrowly shaded with black. Anterior eye-row straight; median eyes separated from each other by a distance a little less than the radius, and from lateral ones by a distance more than the radius. Posterior eye-row slightly procurved; eyes subequal in size, median eyes separated from each other nearly by the diameter. Clypeus longer than the length of ocular area, slightly concave just below eyes and rather slanting forwards. Chelicerae reddish brown, provided with 5 promarginal and 5 retromarginal teeth, and also with a small wart anteriorly. Sternum dark brown suffused with dusky grey, roundly heart-shaped; posterior tip separating coxae IV by a half the long axis. Legs yellowish



Figs. 27–31. *Milleriana ezoensis* sp. nov. — 27. Epigynum. 28. Male cephalothorax, lateral view. 29. Female cephalothorax, lateral view. 30. Male palp, ectal view. 31. Male left palpal tibia, dorsal view. (Scale lines: Figs. 27, 30–31, 0.1 mm.)

brown. Tibiae I–III each with two spines and tibia IV with one spine. Metatarsus IV without trichobothrium, Tm I *ca.* 0.40.

Palp. Ratio of the length of femur to that of patella 3:1. Tibia longer than patella, much widened distally, with 3 trichobothria on dorsum; dorsal margin produced into a broad, bluntly rounded process. Cymbium with a low hump on the lateral margin. Paracymbium stout and strongly curved, with broad and flat distal arm; apical appendage pointing backwards.

Female. Body length 2.6–2.9 mm; cephalothorax 1.10–1.20 mm long, 0.80–0.92 mm wide.

Similar to male in colour and general features. Anterior eye-row straight; median eyes separated from each other nearly by the radius and from lateral ones by the diameter. Posterior eye-row nearly straight; eyes subequal in size and separated by nearly equal intervals a little shorter than the diameter. Sternum like that of male in shape, but posteriorly produced between hind coxae which are separated by a space more than the radius. Palpal tibia with three trichobothria on dorsum.

Holotype: ♂, Mts. Daisetsu (Hirayama), Hokkaido, 8–VIII–1980, N. YASUDA leg. (NSMT-Ar 1079). Paratypes: 4 ♀♀ 2 ♂♂, same data as holotype (NSMT-Ar 1080).

Other specimens examined: 1 ♂, Mt. Niseikaushuppe, Hokkaido, 16–VII–1984, N. YASUDA leg.; 1 ♀ 1 ♂, Yukomanbetsu, Hokkaido, 17–VII–1984, H. UBUKATA leg.

Remarks. Although a probable synonymy is suggested by MILLIDGE (1977) between *Milleriana* DENIS, 1966 and *Catabrithorax* CHAMBERLIN, 1920, I treat this provisionally as a new species of the genus *Milleriana*. This new species is greatly different from the other known species of the genus *Milleriana* in the structural details of male palp and epigynum.

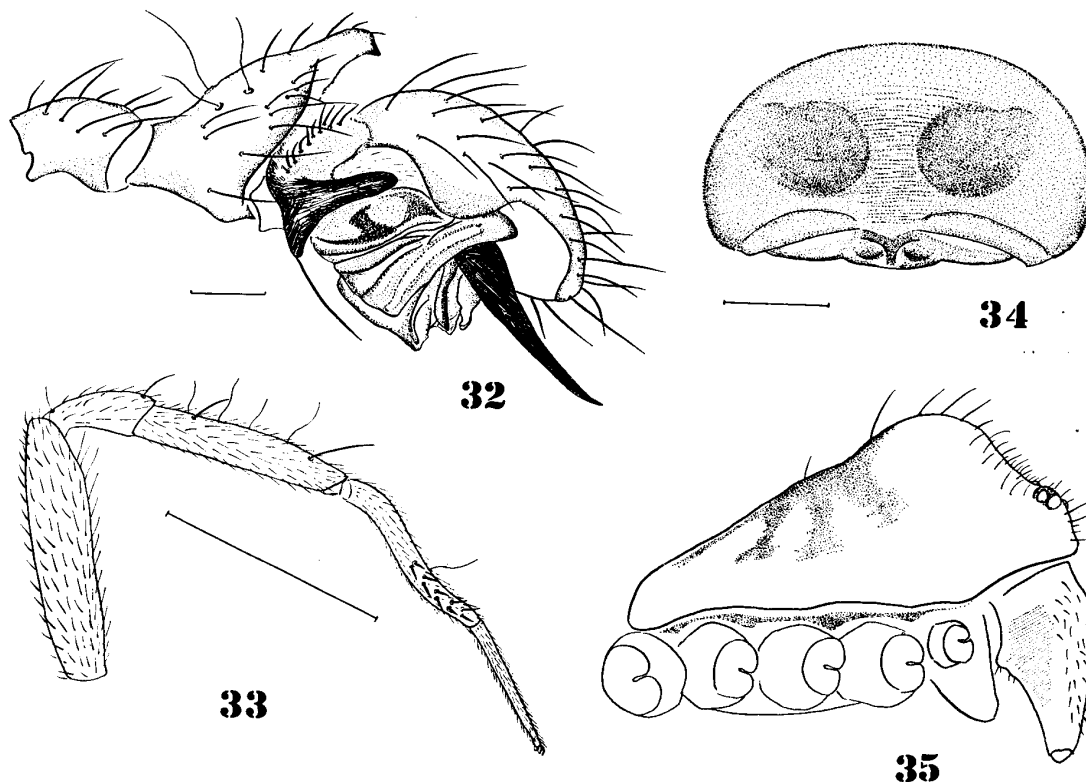
***Hilaira monedula* sp. nov.**

[Japanese name: Karasu-nukagumo]

(Figs. 32–35)

Male. Body length 3.1 mm; cephalothorax 1.58 mm long, 1.13 mm wide.

Colour of cephalothorax and appendages brown, with chelicerae darker and more reddish. Head steeply elevated at the back of eye area, with many short bristles in front. Anterior median eyes smaller than the remainder, separated from each other by the diameter, and from lateral ones about 1.5 times the diameter. Posterior eyes subequal in size, separated by nearly equal intervals 1.5 times the diameter of eye. Clypeus narrower than the length of median ocular area, with some erect bristles below anterior eyes. Chelicerae with 5 large promarginal and 5 small retromarginal teeth. Sternum slightly convex, roundly heart-shaped, sparsely with long bristles. Hind coxae separated by a half the long axis. Legs moderately long. Tibiae each with two spines. Metatarsus IV with a trichobothrium, its position *ca.* 0.63 almost as in



Figs. 32–35. *Hilaira monedula* sp. nov. — 32. Male palp, ectal view. 33. Male leg I, lateral view. 34. Epigynum. 35. Male cephalothorax, lateral view. (Scale lines: Figs. 32, 34, 0.1 mm; Fig. 33, 1.0 mm.)

Tm I. Metatarsus I slightly sigmoid, bearing about 10 short spines in two rows. Abdomen dark grey to black, without any markings.

Palp. Ratio of the length of femur to that of patella 43: 15. Tibia longer than patella, much widened distally; dorsal margin produced into a triangular apophysis slightly curved outwards. Paracymbium strongly curved; proximal arm with about ten short bristles in a row; distal arm flat and slender, bluntly pointed at the tip. Embolus long and tapering, gently curved upwards, sharply pointed at the tip.

Female. Body length 2.9–3.0 mm; cephalothorax 1.25–1.38 mm long, 0.95–1.03 mm wide.

Colour and general appearance almost as in male. Anterior eye-row straight; median eyes separated from each other by a distance a little shorter than the diameter and from lateral ones by the diameter. Clypeus as long as the length of median ocular area. Hind coxae separated by the long axis. Chelicerae with 3–4 minute retro-marginal teeth and 6 promarginal teeth, of which 2 distal ones are very small and close together. Epigynum large and simple, resembling those of *H. excisa* (O. P.-CAMBRIDGE, 1870), *H. tatrica* KULCZYNSKI, 1915, and *H. montigena* (L. KOCH, 1872) with differences as shown in Fig. 34.

Holotype: ♂, Mt. Kurodake, Hokkaido, 27–VII–1980, N. YASUDA leg. (NSMT-

Ar 1081). Paratypes: 1 ♀, Mts. Daisetsu (Kumonodaira), 16–VII–1980, same collector as holotype (NSMT-Ar 1082); 2 ♀♀, Mts. Daisetsu (Hokkaidaira), 12–VIII–1980, do. (NSMT-Ar 1083); 3 ♂♂, Mt. Hakuundake, 1–VIII–1983, do. (NSMT-Ar 1084); 1 ♀, Mts. Daisetsu (Koizumidaira), 2–VIII–1983, do. (NSMT-Ar 1085).

Other specimens examined: 10 ♂♂, Mt. Niseikaushuppe, 16–VII–1984, same collector as holotype; 1 ♂, Mt. Kurodake, 31–V–1984, do.; 1 ♀, Mt. Hakuundake, 29–VI–1984, do.

Remarks. This new species is very similar to *H. herniosa* (THORELL, 1875), particularly in male, but may be distinguished from the latter by the structural details of epigynum.

References

- AKIYAMA, T., 1960. Spiders from Teuri and Yagishiri Islands. *Atypus*, (20): 16–17. (In Japanese.)
 ——— 1961 a. On the spiders from Rishiri, Rebun and Todo Islands. *Ibid.*, (23/24): 77–82. (In Japanese.)
 ——— 1961 b. Notes on some spiders from Yukomanbetsu, Hokkaido. *Asahikawa munic. Mus.*, (Youth Educ.), (1): 5–6. (In Japanese.)
 ——— 1962. Notes on the spiders from Asahikawa, Hokkaido. *Ibid.*, (2): 1–12. (In Japanese.)
 CHAMBERLIN, R. V., 1920. New spiders from Utah. *Can. Ent.*, **52**: 193–200.
 DENIS, J., 1966. *Milleriana*, a new genus for a British spider (*Scotargus inerrans* (O.P.-C)). *Bull. Br. Spider Study Group*, (31): 9.
 HOLM, Å., 1973. On the spiders collected during the Swedish expedition to Novaya Zemlya and Yenisey in 1875 and 1876. *Zool. Scr.*, **2**: 71–110.
 KOCH, L., 1879. Arachniden aus Sibirien und Novaja Semlja eingesammelt von der schwedischen Expedition im Jahre 1875. *K. Svenska Vet. Akad. Handl.*, **16** (5): 1–136, pls. 1–7.
 KULCZYŃSKI, W., 1915. Fragmenta arachnologica, X. XVIII. Araneorum species nonnullae novae aut minus cognitae. Descriptiones et adnotationes. *Bull. int. Acad. Sci. Cracov., Cl. Sci. math. nat.*, (B), **1914**: 897–942, pl. 66.
 ——— 1916. Araneae Sibiriae occidentalis arctiae. *Mém. Acad. imp. Sci., Petrograd*, (8), **28** (11): 2+1–44, pls. 14–15.
 ——— 1926. Arachnoidea camtschadalica. *Ann. Mus. Zool.*, **27**: 29–72, pls. 2–3.
 KUMADA, K., 1979 a. Dôhoku Kikô. *Kishidaia*, (44): 17–22. (In Japanese.)
 ——— 1979 b. Spiders from the northern part of Hokkaido. *Ibid.*, (44): 23–28. (In Japanese.)
 MATSUMURA, M., 1894. Atsuta Saishû Kikô. *Zool. Mag., Tokyo*, **6**: 162–170. (In Japanese.)
 MENGE, A., 1868. Preussische Spinnen. II Abt. *Schr. Naturf. Ges. Danzig*, (N.F.), **2**: 153–218.
 MILLIDGE, A. F., 1977. The conformation of the male palpal organs of Linyphiid spiders, and its application to the taxonomic and phylogenetic analysis of the family (Araneae: Linyphiidae) *Bull. Br. arach. Soc.*, **4**: 1–60.
 OI, R., 1960. Linyphiid spiders of Japan. *J. Inst. Polytech., Osaka City Univ.*, (D), **11**: 137–244, pls. 1–26.
 PICKARD-CAMBRIDGE, O., 1870. Descriptions of some British spiders new to science. *Trans. Linn. Soc. Lond.*, **27**: 393–464, pls. 1–4.
 ——— 1873. On new and rare British spiders. *Ibid.*, **28**: 523–559, pl. 1.
 SAITO, H., 1980. Descriptions of two new species of the *Tapinocyba* SIMON (Araneae: Erigonidae) from Japan. *Acta arach.*, **29**: 65–71.
 ——— 1980. Notes on linyphiine and erigonine spiders from Hokkaido, Japan. *Kishidaia*, (49): 8–21. (In Japanese.)

- SAITO, H., 1983. Notes on linyphiine and erigonine spiders from Hokkaido, Japan, (2). *Insect, Utsunomiya*, (34): 50–60. (In Japanese.)
- SAITO, S., 1933. Spiders from the Islands of Rishiri and Rebun. *Proc. Imp. Acad.*, **9**: 273–279.
- 1934. Spiders from Hokkaido. *J. Fac. Agr., Hokkaido Imp. Univ.*, **33**: 267–362, pls. 12–15.
- SHINKAI, E., & M. TAKENO, 1966. Spiders from Hokkaido. *Katatsumuri*, (15): 42–46. (In Japanese).
- UYEMURA, T., 1937. Spiders from Otaru and Atsuta, Hokkaido, Japan. *Acta arach.*, **2**: 109–111. (In Japanese.)
- WESTRING, N., 1861. Araneae Svecicae. *Göteb. Kongl. Vet. Handl.*, **7**: 1–615.
- WIEHLE, H., 1960. Spinnentiere oder Arachnoidea (Araneae). XI: Micryphantidae-Zwergspinnen. *Tierwelt Dtsch.*, (47): 1–620.
- 1963. Beiträge zur Kenntnis der deutschen Spinnenfauna III. *Zool. Jb., Syst.*, **90**: 227–298.
- YAGINUMA, T., 1957. Spiders from Hokkaido and Rishiri Island. *Acta arach.*, **14**: 51–61, pls. 3–4. (In Japanese.)
- 1966. Shima-no-kumo Doutei Kiroku. *Atypus*, (41/42): 42–59. (In Japanese.)
- 1972. Spiders of the Hidaka Mountain Range, Hokkaido, Japan. *Mem. natn. Sci. Mus., Tokyo.*, (5): 17–32. (In Japanese, with English descriptions.)
- & M. OHNO, 1967. The spiders from the islands belonging to Hokkaido, Japan. *J. Toyo Univ., gen. Educ. nat. Sci.*, (8): 13–29. (In Japanese.)
- & Y. NISHIKAWA, 1971. Spiders of Mt. Daisetsu, Hokkaido. *Annual Rept. JIBP/CT-S for the fiscal year of 1970*: 71–96. (In Japanese, with English summary.)
- YASUDA, N., 1979. Notes on the spider fauna of Mt. Daisetsu and Ishikari River Basin I. *Kamikawamachi no Shizen*, (4): 81–82. (In Japanese.)
- 1980. Ditto II. *Ibid.*, (5): 80–90. (In Japanese.)
- 1981. Ditto III. *Ibid.*, (6): 79–80. (In Japanese.)